REMARKS/ARGUMENTS

In the final Office action dated December 31, 2002, claims 1 - 12 were rejected under 35 U.S.C. § 102 as being anticipated by Shiraishi, U.S. Patent No. 5,903,276. Claims 13 - 15 were deemed allowable if rewritten in independent form. By this amendment and the accompanying Request for Continued Examination, Applicant amends claims 1 and 13 - 15 and submits claims 1 - 12 for reconsideration. Claim 1 has been amended without limitation of the original claim to clarify the claim. Claims 13 - 15 have been amended to independent form. These amendments do not narrow the scope of the claims. Hence, they are not limiting amendments.

Applicant again traverses the rejection of claims 1 - 12 under 35 U.S.C. § 102. Shiraishi discloses a method for providing anti-aliasing of edges during the polygon rendering process. Thus, Shiraishi processes edges before the creation of a rastered image.

In contrast, independent claim 1 recites, in part: "application of an edge operator to a rastered image portion for coarsely ascertaining at least one rastered edge configuration in the rastered image portion." Hence, in the claimed invention the edge operator is applied to a rastered image. Thus, claims 1 - 12 are not anticipated by or obvious in view of Shiraishi or any of the other cited references, considered either separately or in combination.

Response to the Rejection of Claims 1 - 12 Under 35 U.S.C. § 102

Claims 1 - 12 stand rejected under 35 U.S.C. 102(b) as being anticipated by Shiraishi (5,903,276). Regarding claim 1, the Office Action states at paragraph 6:

> Shiraishi discloses a method of eliminating unwanted steps at edges in image representations in the line raster, in particular in on-line operation, characterized by the steps:

a) application of an edge operator to an image portion for coarsely ascertaining at least one rastered edge configuration (Figure 1 3 Drawing Processing Unit),

b) determining the position of at least a first pixel from the amount of those pixels which form the rastered edge configuration or adjoin said rastered edge configuration (Figure 4, "Each edge of the polygons defined by these apexes has a X-start point ... a Y-start point ...", column 7, line 13-23,

c) approximation of a straight line for ascertaining a probable configuration of the unrastered image edge in the proximity of the first pixel (Figure 5 is an illustrative drawing directions of the vector, column 7, line 26-27),

d) ascertaining a criterion from the approximation straight line and the position of the first pixel for mixing a color X to the Color C in the first pixel considered (Figure 38 establishes the criterion to mixing the color, column 20, line 62-column 22, line 24), and

e) mixing the ascertained color X to the color C in the first pixel considered (Figure 49, where a dot is considered a pixel, column 49, line 10-14).

In response to the arguments Applicant submitted on November 13, 2002, the Office action states at paragraph 2:

> The Applicant argues in claim 1, Shiraishi does not disclose the step of "application of an edge operator to an image portion for coarsely ascertaining at least one rastered edge configuration." This argument is not persuasive because Shiraishi's method is useful in computer image generation using pixels (column 1, line 12-30). As it is well known in the art, an image of geometrical shape

has to be rasterized to be generated. Therefore, a polygon edge disclosed in Shiraishi's teaching is a rastered edge.

Applicant respectfully disagrees with the contention that the polygon edge disclosed in Shiraishi is a rastered edge as claimed. The method of Shiraishi processes polygon edges to generate a rastered image. Shiraishi does not disclose the application of an edge operator to a rastered image.

The differences between Shiraishi and the claimed invention may be further clarified by a comparison of the respective inputs and outputs of the method of Shiraishi and the claimed method.

The anti-aliasing method of Shiraishi is an integral part of a method of mapping a polygon representation of an image (the input to the Shiraishi method) onto a pixel matrix representing an anti-alised rastered image (the output of the Shiraishi method). See, for example, Shiraishi's Abstract and the following citations which summarize the method described by Shiraishi:

a) creating and storing polygon image data (column 6, lines 25 to 41),

b) extracting coordinates of the end points of the edges of the polygons (column 7, lines 13 to 23),

c) determining the orientation of the edges (left, right) (column 7, lines 25 to 32),

d) calculating the edge slopes (column 8, line 30 to column 9, line 2) with the aid of the coordinates of the end-points of the edges,

e) interpolating and storing the edge coordinates X, Y, Z (column 9, lines 20 to 30),

f) calculating for every pixel the portion of the polygons in the pixel area (column 6, lines 44 to 47, column 10, lines 50 to 55). This comprises first quantizing and coding of the edge slope (column 11, lines 4 to 14), and determining and

coding the crossing points of the edges with the sides of the pixels (column 11, line 31f),

g) determining the color of a pixel with the aid of the portion of the pixel areas on both sides of the edge.

In contrast, in the claimed method the edge operator is applied to a rastered image to produce an anti-aliased rastered image. As the anti-aliasing is performed after obtaining a rastered image, the method may be referred to as "post-anti-aliasing."

The method of Shiraishi is not "post-anti-aliasing" because it performs anti-aliasing operations during the rendering process before the rastered image is formed. Hence, Shiraishi is directed to an entirely different process than the claimed invention.

The statements in the Office action at paragraph 20 and quoted above are misplaced. A polygon image representation of an edge is not the same thing as a rastered image representation of an edge.

As discussed in Shiraishi at column 6, lines 29 - 33, the objects constituting the image are represented by polygons. Polygons are represented by the coordinates of their apexes and by normal vectors. A polygon edge is defined by the apexes of the polygons (see, for example, column 7, lines 16 - 24), and represented by a vector (see, for example, column 7, lines 25 and 25 and Figure 5).

In contrast, a rastered image is, as is well known in the art, represented by matrix coordinates (for example, x, y) and color coordinates (for example, RGB) allocated to the matrix coordinates.

Hence, Shiraishi does not disclose "application of an edge operator to a rastered image portion for coarsely ascertaining at least one rastered edge configuration in the rastered image portion" as claimed.

The differences between the method disclosed in Shiraishi and the claimed method are further illustrated by the operation of the "edge operator." The claimed method may function without any information

regarding the edges in the image. Instead, this information may be ascertained by "application of an edge operator."

In contrast, since the Shiraishi method starts with polygon data containing all necessary information on edge coordinates, such an edge operator is unnecessary.

The above distinction illustrates a significant advantage of the claimed method over conventional methods. Because the claimed method may function without any information regarding the edges in the image, the method may be independent of the rendering method used for creating pixel data. In contrast, the method of Shiraishi only performs its anti-aliasing as an integral part of the rendering process that comprises calculating polygon image data of the objects to be displayed in the image.

In summary, none of the cited references teach or suggest any "post-anti-aliasing" method, much less Applicant's claimed method. Accordingly, Applicant submits that independent claim 1 and claims 2 - 12 that depend on claim 1 are not anticipated by nor obvious in view of the cited references.

Conclusion

For the foregoing reasons, Applicant submits that all claims are allowable over the cited references. Accordingly, Applicant respectfully requests allowance of this application.

Respectfully submitted,
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